F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

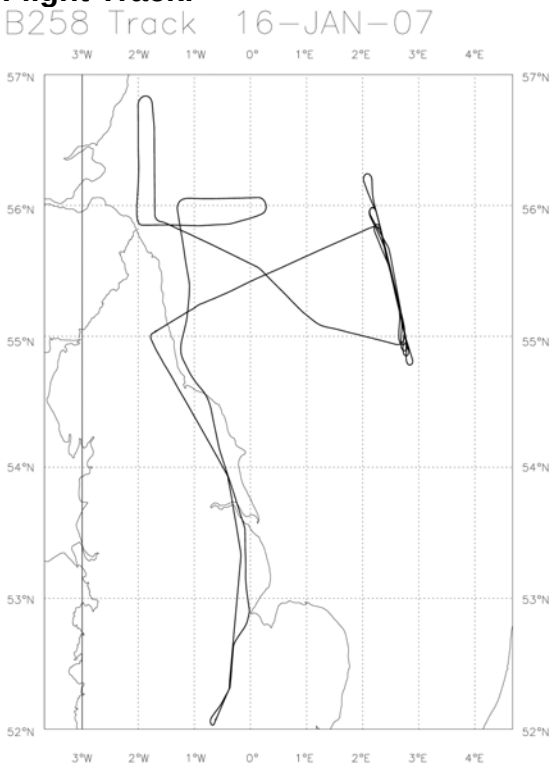
Flight No.:	B258	
Date:	16 January 2007	
Take Off	09:59:18Z	16:13:05Z
Landing:	14:58:02Z	16:57:37Z
Flight Time	4h58m44	0h44m30

Campaign: WINTEX – CAESAR

Operating Area: N Sea

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM	Gaynor Ottaway	Directflight
4	Mission Scientist	Ben Johnson	Met Office
5	Flight Manager	Mo Smith	FAAM
6	AVAPS	Stuart Heath	FAAM
7	Cloud Physics / CCM2	Paul James	FAAM
8	ARIES	Stuart Newman	Met Office
9	SWS	Andy Wilson	Met Office
10	MARSS & DEIMOS	Jeff Brown	Met Office
11	Mission Scientist 2	Phil Brown	Met Office
12			
13			
14			
15			
16			
17			
18			
19			
20			

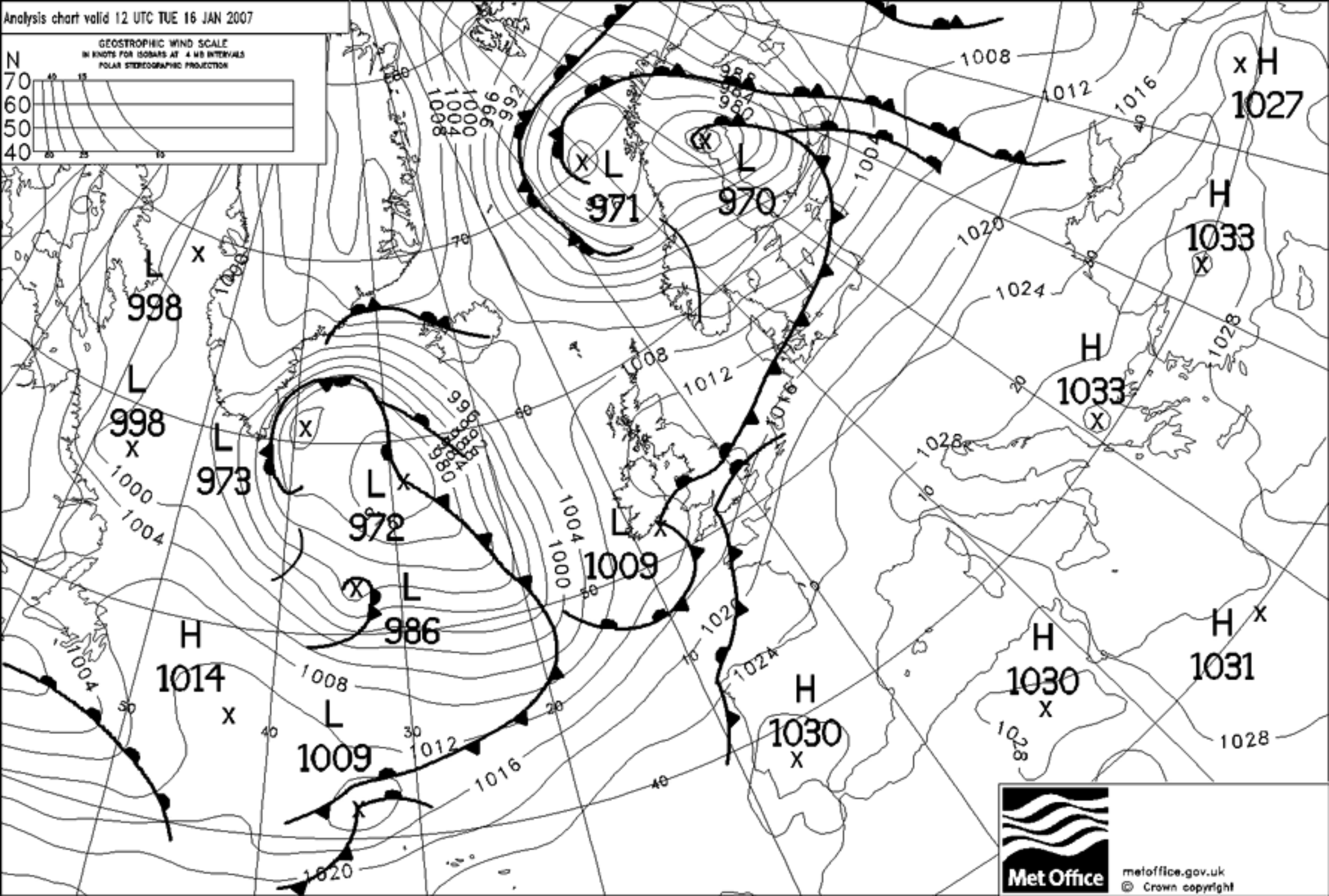
Flight Track:



FLIGHT SUMMARY

Flight No b258
Date: 16 Jan 2007
Project: WINTEX - CAESAR
Location: North Sea

Start Time	End Time	Event	Height (s)	Hdg	Comments
085809		Start-Up	0.34 kft	126	52'04.36N, 0'37.48W
093301		INU	0.34 kft	126	To Navigate mode
095918		T/O	0.97 kft	215	Cranfield
100500		Turb Probe	24.0 kft	300	P0 Frozen
102620		Video	18.0 kft	327	Start FFC & UFC/DFC
105402	105627	Profile 1	24.0 - 26.0 kft	093	
105928	110130	Profile 1	26.0 - 28.0 kft	252	
110131	111544	Run 1	28.0 kft	256	
110340		Heimann	28.0 kft	260	Cal +5 to -2C
111706	112011	Profile 2	28.0 - 26.1 kft	347	
112011	112531	Run 2	26.1 - 26.0 kft	352	
112800	113253	Profile 3.1	26.0 - 21.6 kft	184	Sawtooth 1
113254	113930	Profile 3.2	21.5 - 28.0 kft	190	
114112	115006	Profile 4.1	28.0 - 20.1 kft	117	Sawtooth 2
115007	115510	Profile 4.2	20.1 - 24.5 kft	118	
115510	120813	Run 3	24.5 kft	138	In Cirrus
115758		Video	24.5 kft	139	Change Tapes
120954	121630	Profile 5	24.6 - 30.0 kft	331	500fpm
121828	122043	Profile 6	30.0 - 28.0 kft	327	
122248	123314	Run 4	28.1 kft	163	
123314	123553	Profile 7	28.1 - 30.0 kft	181	
123752	124930	Run 5	30.0 kft	347	Contrailling
123815		Sonde	30.1 kft	354	Launch #01
124324		Sonde	30.0 kft	325	Launch #02
124853		Sonde	30.0 kft	325	Launch #03
125129	125958	Profile 8	30.0 - 22.0 kft	165	
130023	130315	Profile 9	22.0 - 24.0 kft	177	
130620	131722	Run 6	24.0 kft	346	
131924	132516	Profile 10.1	24.0 - 30.0 kft	165	Sawtooth 3
132517	133016	Profile 10.2	30.0 - 26.0 kft	178	
133220	134416	Run 7	26.0 kft	345	
133609		Video	26.0 kft	329	Change Tapes
134417	134642	Profile 11	26.0 - 28.0 kft	329	
134917	135115	Profile 11	28.0 - 30.0 kft	168	
135203	135921	Run	30.0 kft	171	
135921	140652	Profile 12	29.6 - 22.0 kft	178	
140847	141128	Profile 12	22.0 - 20.0 kft	347	
141128	142131	Run 9	20.0 kft	329	
141358		Heimann	20.0 kft	331	Cal - suspect
145802		Land	0.30 kft	245	Newcastle - Refuel
155809		Position	0.31 kft	197	55'02.00N, 1'41.93W
161305		T/O	0.99 kft	245	Newcastle
162510		Event	13.0 kft	148	Deimos ON (CO Test)
164533		Event	8.2 kft	192	Deimos OFF
165737		Land	0.41 kft	260	Cranfield
170151		Shutdown	0.40 kft	312	52'04.36N, 0'37.50W


Analysis chart valid 12 UTC TUE 16 JAN 2007
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
40
15
60
25
10
L 971
L 970
L 998
L 998
L 973
L 972
L 986
L 1009
H 1014
L 1009
H 1027
H 1033
H 1033
H 1030
H 1031
H 1030
1008
1012
1016
1020
1024
1028
1000
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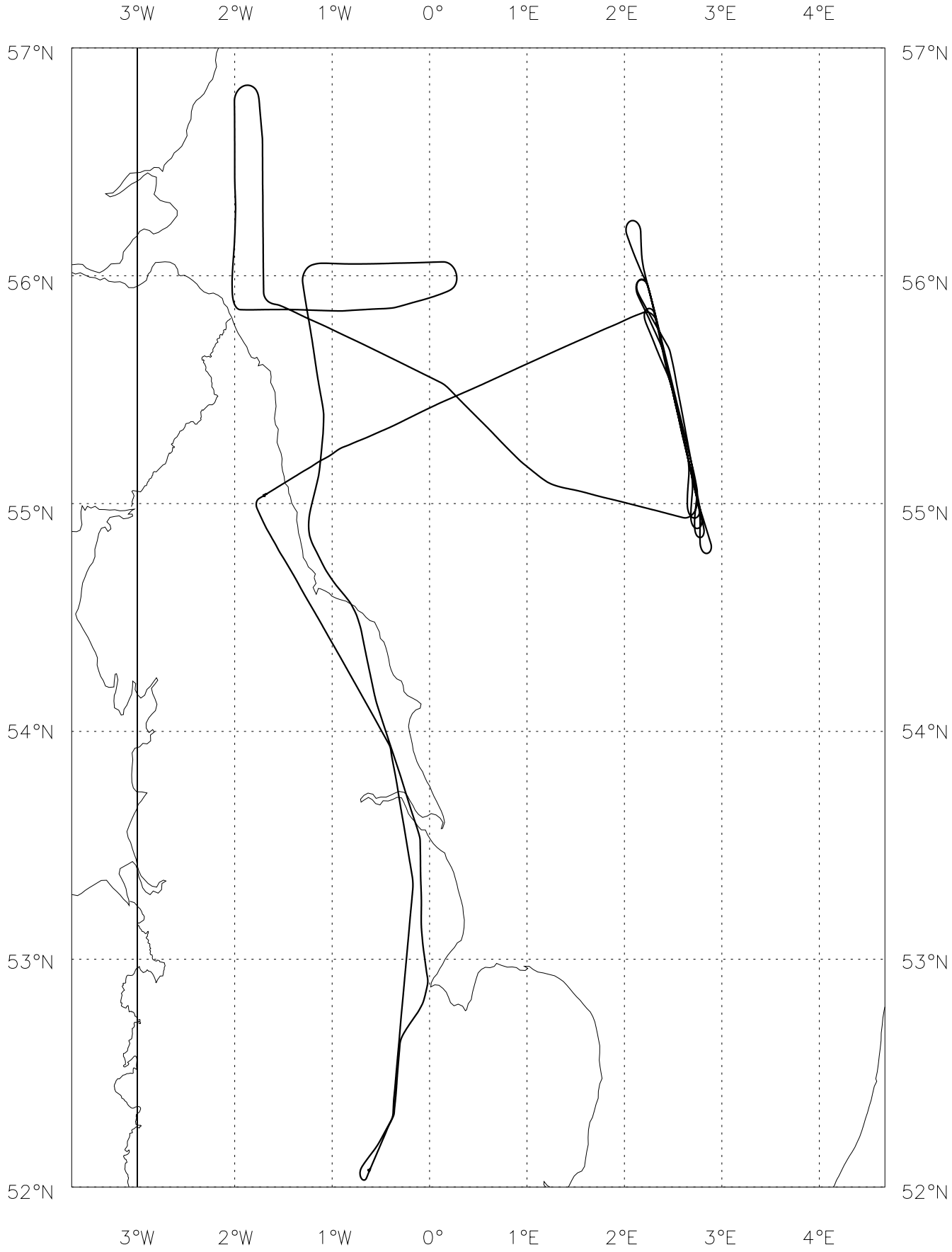
B258 Track 16-JAN-07



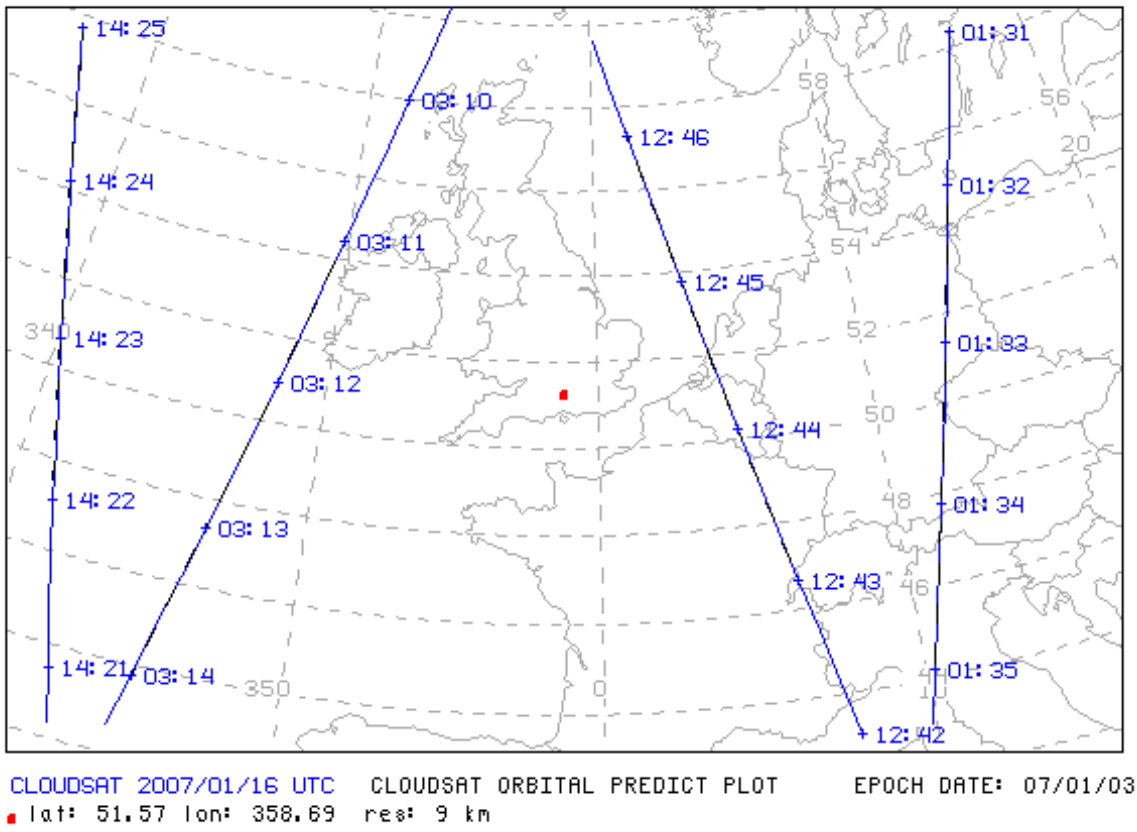
CAESAR Sortie Brief
Radar validation and intercomparison of cirrus microphysics

B258 16/1/07

Aim:

The aim of this sortie is to obtain a good statistical representation of the in-situ microphysics of a frontal or convective cirrus case, which is coincident with radar measurements from CloudSat. Measurements should be made between fixed ground points (not advecting with the wind), so that the cirrus is well represented. The exact location and duration of the runs are to be determined from the cirrus location.
A few runs above and below the cloud are to be made for radiative measurements, in addition to the saw tooth manoeuvres for the in-situ measurements.

Coincident with CloudSat overpass 12:45



Weather conditions:

Convective, frontal or Lee wave cirrus, ideally with clear skies below. It is essential to be able to get above the cirrus. Small amounts of low cloud are acceptable if they are measurable by the radar.

Locations:

Over sea (under or slightly upwind of the CloudSat sub-orbital track).

Clearances:

NOTAMS will be required for dropping sondes.

Instruments required:

Critical: SID1, 2DC, 2DP, FFSSP, Temp, Humidity
Desirable: SID2, CIPs, CPI, AVAPS, ARIES, SWS , MARSS, TAFTS, SHIMS, Heimann, Core chem (automatic mode acceptable)

Sub-orbital satellite points:

A) 53.859 N, 3.3728 E (decimal points)
B) 57.3816 N, 1.4937 E

Fly along section of sub-orbital track where the cirrus is located.
.
The footprint of the CloudSat radar is 1.4km (across track) x 2.5km (along track).

B258 16/1/07 CAESAR radar validation

		Manoeuvre	Duration (min)	Total time (min)
1		Takeoff from Cranfield		
2	1000	Transit to cirrus location under or slightly upwind of the suborbital track, to a level 1000ft below the cloud base.	70	70
3	1110	Perform a series of ascending and descending profiles in a saw tooth pattern through the cirrus to an altitude of 1000ft above and below the cloud respectively, along or perpendicular to the wind, covering fixed ground positions A - B.	80	150
5	1230	Profile ascent to 1000ft above cirrus	10	160
6	1240	1 straight and level run above cloud, of 10 mins. Drop 1 or 2 sondes. **Satellite overpass** ideally during run.	10	170
7	1250	Reciprocal straight and level run above cloud, of 10 mins.	10	180
8	1300	Perform a series of ascending and descending profiles in a saw tooth pattern through the cirrus to an altitude of 1000ft above and below the cloud respectively, between A and B	80	260
9	1420	Profile descent to 1000ft below cirrus	10	270
9	1430	1 straight and level run 1000ft below cirrus base, of 10 mins	10	280
11	1440	Transit to Newcastle for refuel	30	310
12	1510	Land		

Note: additional time has been given for the outbound transit to ensure the best cirrus section has been identified along the sub-orbital track.

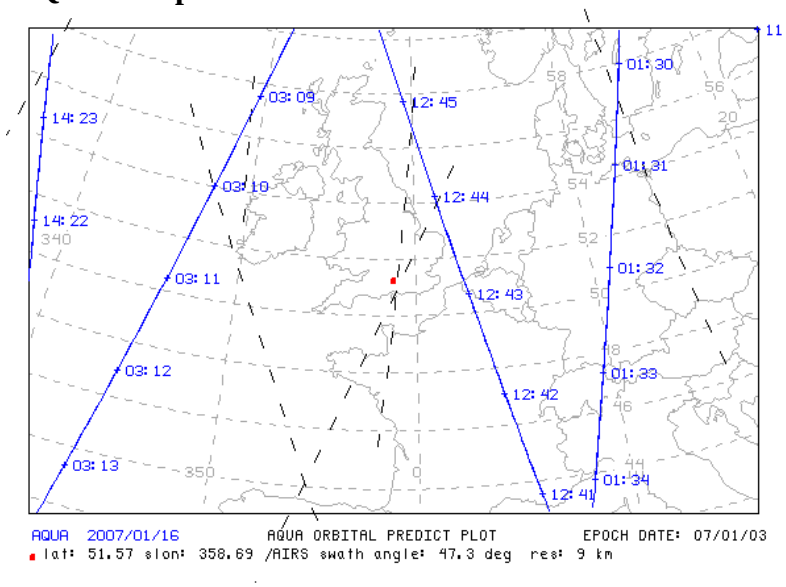
If cirrus is not extending to subsatellite area then change to:

Option 2: Radiative properties of cirrus

Aim:

The aim of this sortie is to determine the radiative properties of frontal cirrus using multiple frequencies from the range of remote sensing instruments on the aircraft. For closure it is also important to determine the in-situ properties of the cloud and to make radiative measurements of the atmosphere above and below the cirrus. To obtain in-situ vertical distributions either perform profile ascents and descents, or a Lagrangian spiral descent if the cirrus is extensive and homogenous. Measurements should be made **advecting with the wind**, such that the same airmass is continuously measured.
Straight and level runs should be made below, above and in the cirrus. A 100ft run over the sea will be required to measure the SST. Orbits are to be made below the cloud with SWS viewing upwards to determine the phase function of the ice particles.

Coincident with AQUA overpass at 12:44



Weather conditions:

Convective, frontal or Lee wave cirrus. Clear sky below the cirrus in the measurement area is essential. Ideally the cirrus should not extend above 35,000ft.

Locations:

North sea.

Clearances:

NOTAMS will be required for dropping sondes and runs at 100ft.

Instruments required:

Critical: ARIES, SWS, SID1, 2DC, Temp, Humidity, AVAPS
Desirable: MARSS, TAFTS, SHIMS, CPI, SID2, FFSSP, 2DP, CIPs, Heimann, Core chem (auto mode OK)

	Manoeuvre	**Duration (min)**	**Total time (min)**
1	Takeoff from Cranfield		0
2	Transit at appropriate level to enter operating area at min altitude	45	45
3	Straight and level run of 10 mins duration at 100 ft over sea only.	10	55
4	Profile ascent from min altitude to 1000ft below cirrus base at 1000ft/min (interrupted when necessary)	35	90
5	Fly 3 straight and level reciprocal runs 1000ft below cirrus, orientated across wind, each of 10 mins.	35	125
6	Fly two orbits below cloud at SZA (or max) banking angle	10	135
7	Profile ascent to 1000ft above cirrus base	5	140
8	Fly one straight and level run in cloud, orientated across wind, of 10 mins	10	150
9	Profile ascent to 1000ft below cirrus top	10	160
10	Fly one straight and level run in cloud, orientated across wind, of 10 mins	10	170
11	Profile ascent to 1000ft above cirrus top	5	175
12	Fly three straight and level reciprocal runs 1000ft above cirrus, orientated across wind, each of 10 mins. Drop between 1 and 3 sondes during one run, ideally during satellite overpass	35	210
13	**EITHER** Perform a Lagrangian spiral descent at 2 ms-1, advecting with the wind, to 1000ft below cirrus base, then go to 16	25	235
13	**OR** Profile descent to level approx. half way between cloud top and base	5	215
14	Fly 1 or 2 straight and level runs 1000ft in cloud, orientated across wind, of 10 mins	10	225
15	Profile descent to 1000ft below cloud base	10	235
16	Fly one straight and level run 1000ft below cirrus base, orientated across wind, of 10 mins.	10	245
17	Perform one orbit at SZA (or max) banking angle	5	250
18	Profile descent to transit altitude	10	260
19	Transit to Newcastle for refuel or directly to Cranfield	45	305

Additional activities:

Observation of contrail presence or absence behind aircraft.

The aim is to acquire data that can be used to provide additional validation of a new contrail prediction algorithm that is being developed for defence customer use.

Weather conditions: No special conditions required but contrail formation is unlikely at temperatures warmer than about -45 degC.
Manoeuvres: No special manoeuvres required.
Special instrument instructions: When operating below -45 degC, the video-recording should be switched to include the rear-facing camera, unless otherwise required by the main mission science. Mission scientist 2 should monitor the video display and record log entries for both presence *and absence* of contrails behind the aircraft.

Instrument operator instructions:

ARIES and SWS

- Both instruments must point in the same direction as each other (except during cal). ARIES needs to tell SWS where it is pointing.
- Majority of time should be towards the cloud (or sea at 100ft)
- However, still need some data pointing away to characterise the atmosphere above and below the cloud (e.g. ~2 mins of 10 min run)
- For orbits both instruments should view towards cloud for whole time

ARIES

- Be careful when viewing zenith that the instrument remains stable. 1 min views with 1 min cals seem to be OK.
- let SWS know which viewing direction and when.

SWS

- Zenith = 6 deg forward

Mission scientist Debrief Flight No. B259

Ben Johnson 19 Jan 2007

Stratocumulus over the ocean

Weather:
A warm front, orientated at 130 degree, was approaching front the southwest. Cold front was just west of Ireland and orientated 200 degrees. During the flight we went through this front into the bulk of the warm sector. High level cirrus was observed as the warm front approached. Slightly broken and non-precipitating mid level cloud was observed in the warm sector whenever the aircraft came above the BL cloud top.

Operating region:
SW approaches out as far as 49N, 8W, and over East Devon.

Mission objectives:
In-situ measurement of the microphysical and dynamical properties of stratocumulus over the ocean and advecting on to the land.

Flight patterns:
Take off at 1200Z from Cranfield. Transit to SW approaches at FL180 via Bristol channel. Profile descent to 1000ft just off Cornwall. A series of sawtooth profiles were flown from minimum permitted altitude (we were often still in cloud at 1000ft and could go no lower) to 5000 or 6000ft. These were continued out further to the south-west (deep into the warm sector). Boundary layer height was around 5500ft but this varied through the flight and was generally lower (between 4500 and 5000ft). There was no consistent pattern in terms of cloud tops and bases. Often there were two or three separate layers of cloud within the BL. The lowest layer was around 100ft asl and seemed to correspond to a surface mixed layer. Above that was a slight inversion of 1K or so, with a very slight drop in humidity mixing ratio. Cloud layers were then observed mid way in the BL and just below the BL top. These cloud layers were broken in places, and quite variable. The top of the highest cloud layer (BL top) also varied by 200-500 ft over the course of 10 min runs. Each layer was usually quite thin (1000ft or less). These cloud conditions were not a classic or easily workable case. A series of SLRs were flown at 100, 1000, 3500, 2900, and 3100ft. A profile ascent was made up to FL180 where a sonde was dropped. Maximum ascent and descent rate was used once above the BL to minimise time spent in this exercise. Descent was made to 2,200ft in the Bristol channel. Then a series of 4 runs were made over East Devon at altitudes of 2700, 1000, 3700 and 4200ft. Before the 1000ft run an approach was made to Exeter airport to enable a safe descent to that altitude given that visual contact with the ground was not possible at 2,700ft (the minimum permitted altitude in-cloud over that track). The runs at 2,700 and 3700ft were in cloud most of the time. The run at 4200ft was sometimes above the cloud top and sometimes just below it. The later run was extended further out over the English channel, whereas the first run did not go much beyond Exmouth. A profile ascent to 8000ft was made on-transit back to Cranfield.

Summary:

A complex situation with a slightly stratified BL with variable amounts of cloud observed at almost every height from 800ft up to the BL top. This may prove useful as a land/sea contrast or evolution case study or for studying warm sector BL processes.

Mission Scientist's Log

Flight No **B**...258..... Date 16/1/07 Name Ben Johnson Page 1 of 3

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
100001					T10
101200		FL130			Transit at FL130
102500		FL260			Climb to continue transit
103200		FL240		54.5 1E	Encountered cloud base ~FL215
	Tephigram shows moist from FL200 upwards				
	Some higher v. thin layers of ci above				
	P1	FL240	E	56N, 1.3W	Climb because patch of missed
105657	Interrupt	FL260	E	56, 0.3E	cirrus is above us. it
105928	P1 Continue	FL280	W		clear skies below apart from
110131	End R1	FL280	E		5% small scraps of marine Sc
110131	R1 Start	FL280	245		cirrus to the W and NW
110300	"	"	260		turning towards more Northerly to aim
111556	End R1		"		for the cirrus
~~111534~~	~~Start R2~~				
111534	P2	FL280	260		Missed cloud again
112011	R2	FL260	0		cloud encountered on
112531	R2	"	0		northerly run close to coast
112800	P3.1	FL260	140		cloud encountered during
113254	P3.2	FL215	190		P3.1 & P.32, running back south
113930	End P3.2	FL280	190		
114112	P4.1	FL280	120	56N 1W	NO cloud here Heading out
11	End P4.1	FL200	120		east to the Satellite track.
	P4.2	FL245	140		
115510	R3	FL245	140		Approaching cloud.
120000	"	FL245	110	55N	went through some cirrus

Cloud

Mission Scientist's Log

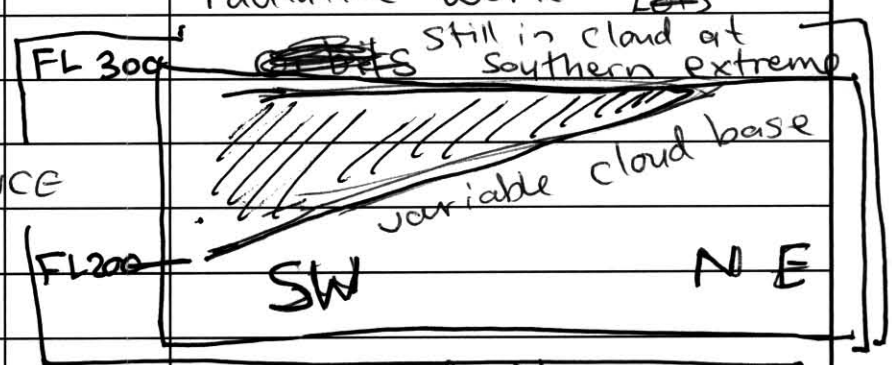
Flight No **B.258** Date 16/1/07 Name Ben Johnson Page 2 of 3

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
120813	End R3	FL285	E		Variable cloud amounts,
~~121028~~					going in and out of it
~~121~~					Reaching Satellite track (A)
120954	P5	FL245	N	A	Going along satellite track
121~~6~~30	End P5	FL300	N	B	Cloud tops around FL290
121828	P6	FL300	N		A= Southern tip of satellite track at 55N
	End P6	FL280	N		
122268	R4	FL280	S		B= Northern tip of satellite track at 56N
123314	End R4	FL280	S		
123314	P7	FL280	S		Still variable patches of cloud
123553	End P7	FL300	S		Some wisps of cloud at FL300 but not much
123752	R5	FL300	N		
123815	"	"	N		Sonde 1 gone
124326	"	"	N		Sonde 2 gone
124853	"	"	N		Sonde 3 gone
12453	End R5	"	N		Sondes dropped beginning, middle and end of track.
125129	P8	FL300	S		Saw tooth 300-220-240
125958	End P8	FL220	S		
130023	P9	FL220	S		Still inter
130315	End P9	FL240	S		[redacted] - mittent cloud amounts
130620	R6	FL240	N		Run @ FL240
131924	P10	FL240	S		Saw tooth 240 300 260
132516	P10.2	FL300	S		
133016		FL260	S		
133220	R7	FL260	N		Run @ FL260

Mission Scientist's Log

Flight No **B** 258 Date 16/1/07 Name Ben Johnson Page 3 of 3

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
134416	End R7	FL260	N		Run at FL260 was also intermittenly through cloud
134617	P11.1	FL260	N		
134642	End P11.2	FL280	N		Cloud still patchy ~~intermittent~~ at all levels
~~135158~~	~~End~~	~~FL300~~			
~~135150~~	R8	~~FL300~~			
134917	P11.2	FL300	S		Run above cloud for radiative work
135150	R8	FL300	S		
135950	End R8	FL300	S		
	P12	FL300	S		Descent to FL200
140652	Interrupt	FL220	S		~~cloud base at FL~~
140847	Resume P12	FL220	N		run below cloud for radiative work ~~Lots~~
141158	End P12	FL200	N		
141158	R9	FL200	N		
142131	End R9	FL200	N		
142131	END OF SCIENCE				



Scrapped idea of orbits because cloud too inhomogeneous.

55N 2.6E

56 2.3E

Mission Scientist's Log #2

Flight No **B**258 Date 16/1/07 Name PHIL BROWN Page 1 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
095857					T/O roll. Heavy rain.
1015		13000	348		On track over Lizds. in thick cloud of frontal zone
1020					Po has series of sawtooth
					oscillations.
1033					Po sawtooth continues.
1057					Pa also frozen at about same
					time.
1058					Turning during climb. Nice
/					cumulus in semi-streets out over NSea to the SE and E.
111624		28000			Have just run towards W,
/		turning N			to run N up 2°W meridian.
/		Seems to be quite dense Ci band			
1119		27000↘			below top of Ci, Sfc obscured below so its quite dense.
112011		26000	350	56 18.0 -1 54.0	End P2 / Start R2
1124		"			Cleared N extent of that piece of Ci.
112530		"			End R2 + descend.
113254		21500			End P3.1 / Start P3.2
115145		21300↗			In profile 4.2
					Turning slightly more to SE to intercept further patch.
			138		3/8 shallow Cu on LHS of track.
115510		24500	138		End P4.2 / Start R3
1200	3				Continuing SE to reach start
/					point of satellite track.
120813	3				End run.
120954	P5	25000			to FL300

Mission Scientist's Log #2

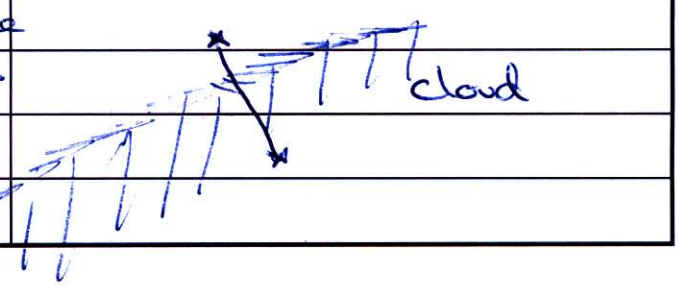
Flight No **B**...258 Date ...16/1/07 Name ...Phil Brown... Page 2 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
124435		28500		In profile,	cloud currently thin
				but looks	thicker out to SW
				in the into-wind	direction.
121828		30000			P6 to FL280.
122043		28000			End P6 e [illegible]
122245		28000	161		Start R4 parallel to last
					track.
1225				Low particle	concs here.
1233				approaching	end of run,
				cloud was clearly	patchy,
				ocean regions	where sfc obscure-
123314		28000	181		End R4 / P7 for 300
				next	run is overpass & Sondes
123752		30000	352		R5
			336		SIDI ~ 10/sec just in
			326		top of cloud layer.
					End run, turn e profile to 220
125129		"	164		Start P8
		27500			Top of a layer here
				e can	see clearly this wisps
				we	had earlier.
		22500			end P8
		24000			end P9 e turn N for run.
130545		"			Nice rosettes. SIDI ~100
130620		"	347		Start R6
					More blobular at start.
					-40°C so all
					good for SID2 clex.
1311		"			SIDI ~100, blobules & rosettes.

Mission Scientist's Log #2

Flight No **B**.258. Date 16/1/07 Name PHIL BROWN Page 3 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
131924		24000	163	55 42.0 -2 12.0	Start P10.1 to Fl 300 then 260
		28000			again getting mostly above again.
—					
—		28300	↘		humidity rises as descend back into layer
133016		26000			end P10.2
133220		26000			start R7 N bound.
1339		〃			22° halo visible.
133943					no v. bright.
		30000			End R8 / start profile.
140652		22000			P12 intercept. cloud at this level.
—					maybe slopes upward toward the N.
—					Turn back N.
—					seem to be in thicker band assoc with frontal wave.
141141					
142133		20000			End run / end science.
				Just	coming under edge of Ci
					band at N end of run.
—				55 48.0 -2 18.0	
1442				Run configs was maybe like this	
				at end	
	Going W to Newcastle				
	cloud is further to S.				



Mission Scientist's Log #2

Flight No **B**...258 Date ..... Name ..... Page 4 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
1446					During recovery, Pa rising
					to 115 hPa, well outside its
					normal operating range. What
					is the spec. of the transducer.
145853					Just at end of landing roll,
					Pa seems to have unfrozen just at
					end of approach, Pa remains frozen.
—					Lifted the radome. Seemed to be
					water on the outside of some of the pipes
					but nothing obvious on the inside. Lowered
					the radome, saw droplet of water within
					the lower attack port. Opened water trap
					but nothing.
					Ca - check, - OK throughout. This is differential
					between top & centre.
					Deduce that Pa must be blocked somewhere
					close to the sensor.
					Similarly, maybe lower side of Pa is also
					blocked close to the sensor.
1557					Just prior to t/o. Pa still giving
					false reading. All others OK.
					Or maybe Pa is blocked on the
					upper side, between the sensor and
					the connection to check sensor

Mission Scientist's Log

Flight No **B**258 Date 16/1/07 Name ..... Page 5 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
1617		After t/o from Newcastle. Seems			
		that Ps sensor was probably			
		reading OK on the ground. Presume			
		its HORACE cal is a bit off such			
		that it reads ~ 15 hPa when			
		stationary. All sensors now			
		seem OK.			
1620		T ~ -15C			
1622		Pa ~ 17 hPa seems high for level			
		flight at ~ 2.8° pitch / AoA.			
1631		Pa seems to be ∝ IAS changes			
		but lower values than during			
		early part of flight.			
1648		in rain.			T = 4.3C
1654		Pa seems to have unfrozen.			
		See screenshots in			
		C:\My Documents\My Pictures			
		on outboard PC.			

CLOUD PHYSICS LOG Flight B 256

Date: 16/01/07	Operator: papj	DRS Time: +0	AU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 1 of 1

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
1055	5	0.1	123	10													Start p1 @250
105657	1700	0.05	123	10													260
																	Pcasp rubbish at this height
110131	1300	0.05	123										.16	431	481		Start run 1 @ 280
1104	2200	0.05	123										Got error warning	Com 4			
1106	1100	0.05	123										.06	4915	18		
1109	4	0.1	124														
1112	3000	0.05	124														
1114	3500	0.05	124														
																	End run 1
111706	4500	0.06	124	100	30	10	400						Rubbish			10	Start p2
112011	5000	0.06	127	100	50	120	250									10	End p2 start run 2
1123	4500	0.06	129														
1125	5500	0.06	129														
112531																	End run 2
112800	5000	0.06	129														Saw tooth
1130	5000	0.06	130	70	1	30	225									10	
1132	5500	0.06	131	200	10	20	500									4	
1136	5000	0.06	134	100	10	40	500									4	
1139	5500	0.07	135														
113930																	End p3.2
114112	6500	0.08	135	80	10												Saw tooth
1145	5000	0.07	135														
1147	7000	0.07	135														
1149	8000	0.07	135														
1151	9000	0.07	135														
1153	4500	0.07	135														
115510	26	0.06	135														Start run 3
1157	30	0.2	137	700	30	100	200									10	
1200	25	0.06	138														
1203	25	0.07	138	70	1												
1205	25	0.08	138	80	1	10	100									10	
1207	23	0.08	139	70	1	50	400									4	
120813																	End run 3

CLOUD PHYSICS LOG Flight B 256

Date: 16/01/07	Operator: papj	DRS Time: +0	AU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 2 of 2

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
120954																	p
121124	20	0.06	141	100	10	20	200									10	260
121248	25	0.07	142	100	10	100	125									11	270
1214	25	0.07	142	10		70	225									10	280
121630	30	0.06															300 end p5
1219	35	0.06	142														290
122043																	End p6
122245	8000?	0.07	143	100	20												Start run 4 @280
1226	6500	0.07	143	100	10												
1228	7000	0.07	144														
123032	8000	0.07	144	100	10	20	100										
123314	11000	0.07															Start p7
123553																	End p7
123732	15000	0.08	146	50													Start run 5
1243	19000	0..08	146	10													
1247	20000	0.08	146														
124913	21000	0.08	146														End run 5
125129	18000	0.07	146														Start p8
1254	120	0.06	146														280
1256	5000	0.07	147	1000	10	20	300									4	
1259	15000	0.08	148														
125958																	End p8
130023	10000	0.07															Start p9
1303	12000	0.08	149	100	10	20	400									4	
1305			150	100	10	10	400									4	
130620	100	0.06	151	100	10	30	400									4	Start run 6
1309			151			10	300									9	
1311			152	100	10	20	200									10	
1314			155	200	10	50	300									10	
1317	90	0.06	156														
131722																	End run 6
131924																	P10.1
132230			157	100	10	10	150									10	260
1325			157														
																	End 10.1
																	Start 10.2
1328			158														280
133016																	End 10.2

CLOUD PHYSICS LOG Flight B 256

Date: 16/01/07	Operator: papj	DRS Time: +0	AU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 3 of 3

G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
133220	100	0.06	158	10		3	200									10	Star run 7
1335			159														
1339			165	1000	100	100	250									4	
134417																	End run 7
1345			167														
1347			167														
1353			167														
1355			167														
135921																	End run 8
1400	136	0.06	167														Start p12
1402	160	0.06	167	10	1	100	250									10	
1404			168														
140652			169	100	10	20	600									4	220
1410			171	100	10	10	600									4	
1413			174	200	10	20	500										End p12 start run 9
1415			175														
1418			175														

Revision date: 20/02/2007 5:40 PM

CLOUD PHYSICS PROCESSING LOG

Flight number: **B258** **T/O:** 095918
Date of flight: 16/1/07 **Land:** 145802

A)	FFSSP PROCESSING	
Processing Stage	Done?	Comments
1) Transfer *.txt files from DVD to processing PC	N	
Bnnn_FFSSP_hh.txt for each hour of data	N	**hh =**
Bnnn_FFSSP_HVMS.txt	N	**Last sec processed =**
2) FTP the files (ascii) from the PC to directory	N	**File size =**
PMSDATA: on FLOODS	N	
3) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FSSP_EXTRACT_TAS**	N	Use time just before/after take-off/landing. If T/O /landing just after/before the hour, ensure start/end time is before/after the hour if there is an FFSSP_hh.txt file for that hour.
a) Flight number: **Bnnn**	N	
b) Path name: **MFDDATA:Bnnn_MFDX**	N	
c) Output directory: **PMSDATA:**	N	
d) Start time: *0 if unknown (see comment box)*	N	
e) End time: *240000 if unknown*	N	
4) FLOODS> **RUN MRFB:[PMS.FAST_FSSP]FFSSP_PROCESS_TXT**	N	
a) Flight number: **Bnnn**	N	
b) Directory: **PMSDATA:**	N	**Total glitches =**
c) TAS in processing: **Y**	N	**Sec file written ok?**
d) Vel threshold (clicks) **0**	N	
e) Calibration file: *Use the most recent calibration file.*	N	**Note calibration file used**
Format FFSSP_CALddmmyyyy.txt	N	
Calibration files to be stored in MRFB:[PMS.FAST_FSSP]	N	
f) Adjust FFSSP time **Y/N**	N	Yes only if gross errors occur
g) If Y, enter value to add to data time (seconds)	N	in FFSSP time eg; ~ 1hour
5) FLOODS> **WAVE**	N	Use PVWAVE for this section
a) WAVE> **write_procffssp_to_m5,'pmsdata:Bnnn_procffssp.dat', 'mfddata:Bnnn_mfdX','pmsdata:Bnnn_m5procffssp',/auto**	N	**Note time correction applied to FFSSP by /auto =**
b) WAVE> **exit**	N	
6) FLOODS> **MODIFY**	N	
a) Modifying datasets: **pmsdata:Bnnn_m5procffssp**	N	**Input file size =**
b) Dataset: **mfddata:Bnnn_mfdX**	N	**M5 output file size =**
c) New dataset: **mfddata:Bnnn_mfdY (y=x+1)**	N	
d) Parameter description file: *leave blank to use default*	N	
7) CHECKS:	N	
i). Are FFSSP and JW/Nevzorov LWC synchronized in time?	**N**	**Synchronized?**
In flight_plot, parameters	N	
JW LWC para 535	N	Not done
Nevzorov LWC para 602	N	
FFSSP LWC para 1202	N	
ii). If not, repeat from step 5b replacing /auto with **addt=x** which adds x+20 secs to FFSSP time.	N	

CLOUD PHYSICS PROCESSING LOG

Flight number: **B258**
Date of Flight: 16/1/07

B) 2D PROCESSING		REPROCESS +1hr
Processing Stage	Done?	Comments
1) Transfer B258.dat file from CD/DVD to PC	Y	
2) Zip up file on PC (B258.zip)	Y	
3) FTP the zipped file (binary) from the PC to the directory	Y	
SEADAS_DATA:[SEADAS_DATA] on FLOODS	Y	
4) Log on to FLOODS	Y	
5) Unzip SEADAS_DATA:[SEADAS_DATA]B258.zip	Y	**Size of B245.dat =797056**
6) FLOODS> **WAVE**	Y	Use PVWAVE for this section
WAVE> **CONVERT_SEADAS_FILE**	Y	**Blocks read =114703**
a) Input file: **SEADAS_DATA:[SEADAS_DATA]B258.dat**	Y	**Blocks written = 114703**
b) Output file:		
SEADAS_DATA:[SEADAS_DATA]B258_seadas.dat	Y	**Bad reads =0**
WAVE> **exit**	Y	
7) FLOODS> **RUN MRFB:[PMS.SEADAS]READM200_FILE**	Y	
a) Default directory: **PMSDATA:**	Y	
b) Flight number: **Bnnn**	Y	
c) Disk file name:		
SEADAS_DATA:[SEADAS_DATA] B258_seadas.dat	Y	
d) Comment string:	Y	
e) Start time: *0 if unknown (T/O – 5 min)*	**Y**	**Start = 095500**
f) End time: *240000 if unknsown (Land + 5 min)*	**Y**	**End = 150000**
g) Read 2DC: **Y**	Y	Ignore error message scroll
h) Read 2DP: **Y**	Y	(vestigial error from tapes)
i) Secondary data: **Y**	Y	
		Are FRW, FSP, IMB,
j) FSP-SYNC: Y	Y	**PCA,SEC**
k) cmd.str: **Y**	Y	**files in PMSDATA?**
l) Auto time correction: **N**	Y	**Are they non-zero in size?**
m) Full length secondary:**N**	y	yes
8) FLOODS> **WAVE**		2D image display and printing
i). WAVE> **imagedisplay**		Must be done from FLOODS
a) 2D directory name: **PMSDATA:**		itself.
b) Flight number: **B258**		
c) Time from IWC plot: **N**		
d) Select probe: (**1**) 2DC (**2**) 2DP		
e) Start time: *As in 7e above*		
f) End time: *As in 7f above*		**Note any problems with**
g) Time interval (sec): **5** recommended (0 for all images)		**images**
ii). WAVE> **auto_image**		Prepare imagery for Core data
a) 2D directory name: **PMSDATA:**		From own PC again
b) Flight number: **B258**		
c) Enter date: **20070116**		
d) Enter start time: *0 if unknown (T/O – 1 min)*		**Start = 095800**
e) Enter end time: *240000 if unknown (Land – 1 min)*		**End =145700**
f) Enter time interval (sec) between successive imaged blocks: **10**		
iii). WAVE> **exit** to create files		FAAM_YYYYMMDD_R0_
iv). FTP ascii *.PS files from PMSDATA: to PC		Bnnn_2Dx-images.ps
v). Load each into Ghostview or other pdf-converter		Notes on this in instructions
vi). Output as pdf file (720 dpi resolution), appending name prefix of **CORE-CLOUD-PHY_** to converted files		

9) FLOODS> **RUN MRFB:[PMS.SPEC2D.AUTO]PROCESS2D_AUTO** a) Flight number: **Bnnn** b) Directory: **PMSDATA:** c) File generation: *Hit enter* d) Time correction: *Time offset of the 2D data* e) TAS: **Y** f) MFD directory: **MFDDATA:B258_MFDX** g) Probe number: (**1**) 2DC (**2**) 2DP (**0**) Both *0 unless either probe known to be faulty* h) Start time: *0 if unknown (T/O + 30sec)* i) End time: *240000 if unknown (Land – 30sec)* j) Nominal averaging: **0.2** seconds for conversion to M5 k) Particle type 2DC: **8** if known to be in ice cloud **11** if known to be in water cloud l) Particle type 2DP: **8** if known to be in mixed-phase **8** if unknown m) Coefficient choice: **2** n) Output root filename: **PMSDATA:Bnnn_PROC2D**		NB. an error message may appear, floating point exception, rerun and use time quoted in error message, repeat until successful. **X =b** **Start =0** **End =** 240000 **Time data processed to =** 121006 **2dproc files present?** *.2dc, *.2dp and *.dat yes
10) FLOODS> **WAVE** i) WAVE> **WRITE_PROC2D_TO_M5, 'PMSDATA:BNNN_PROC2D.DAT', 'PMSDATA:BNNN_M5PROC2D'** ii). **exit**		Use PVWAVE for this section Error message about HDDR file should be ignored. **Records =31**
11) FLOODS> **MODIFY** a) Modifying datasets: **pmsdata:Bnnn_m5proc2D** b) Datset: **mfddata:Bnnn_mfdX** c) New dataset: **mfddata:Bnnn_mfdY** d) Parameter description file: leave blank to use default		 **X =b** **Y = (X+1) c**
12) CHECKS: Are 2DC/2DP IWC of comparable magnitude and well-correlated with Nevzorov TWC? *In flight_plot, parameters* *Nevzerov TWC para 605* *2DC IWC para 1302* *2DP IWC para 1312*		 **Correlated?** Not done

CLOUD PHYSICS PROCESSING LOG

Flight number: **B258**
Date of Flight: 16/1/2007

C) PCASP PROCESSING		
Processing Stage	Done?	Comments
1) Complete stage 7) in 2D processing	Y	
Ensures Bnnn_FSP.DAT containing raw PCASP data is	Y	
written to directory PMSDATA:	y	
2) FLOODS> **RUN MRFB:[PMS.PCASP]PROCPCASP_NEW**	Y	
a) Flight number: **Bnnn**	Y	
b) File name: **PMSDATA:Bnnn_FSP.DAT**	Y	
c) Root output name: **PMSDATA:Bnnn_PROCPCASP**	Y	
Produces PMSDATA:Bnnn_PROCPCASP.DAT (binary)	Y	
PMSDATA:Bnnn_PROCPCASP.OUT (ascii)	Y	
d) Minimum size channel: *default = 1*	**Y**	**Min size =1**
If smallest size channel are known to be noisy the value	Y	
of the highest noise free channel to be entered here	Y	
e) Calibration volume flow rate:		
Use the most recent value. 1.8ccs^{-1}	**Y**	**Vol flow rate =** 1.8
*Calibration files to be stored in **Exeter***	Y	
Entering zero gives default value = 1.0 cm^{3}s^{-1}	Y	
f) Time correction: *Same value as used in 2D processing stage 9d*	Y	
g) Start time: *0 if unknown*	Y	
h) End time: *240000 if unknown*	Y	
3) FLOODS> **WAVE**	Y	Use PVWAVE for this section
i).WAVE> **write_procpcasp_to_m5, 'pmsdata:Bnnn_procpcasp.dat', 'pmsdata:Bnnn_m5procpcasp'**	Y	
ii). WAVE> **exit**	Y	
4) FLOODS> **MODIFY**	Y	
a) Modifying datasets: **pmsdata:Bnnn_m5procpcasp**	Y	
b) Dataset: **mfddata:Bnnn_mfdX**	**Y**	**X =a**
c) New dataset: **mfddata:Bnnn_mfdY**	**Y**	**Y = X+1 =b**
d) Parameter description file: *leave blank to use default*	**Y**	
5) CHECKS		
Are PCASP and NEPH peaks synchronous?		**Merged OK?**
In flight_plot, parameters		
Neph total blue scatter		
PCASP conc para 1550		

FAAM Dropsonde Flight Log

Flight No.	B258	Date	16/01/07
Page No.	1 of 1	Operator	SWH

GMT	Sonde No.	Event	Comments
		e.g. launch, splashdown	*e.g. wind data? PTH data? Lat/Long* *NB strings of dropsonde data contain:* *time, pressure hPa, T deg C, RH %, wind direction deg, wind speed m/s, longitude, latitude, height m*
123817	1	Launch	300.00 -53.80 126.70 244.10 47.20 -14.60 2.724771 54.957073 9005.81 0
124902	1	Splashdown	1012.21 7.04 63.00 316.25 4.21 -10.52 2.950914 55.004897 51.88 7
124326	2	Launch	300.50 -53.40 43.19 243.50 49.10 -16.60 2.548051 55.424360 8964.13 0
125355	2	Splashdown	1012.64 6.77 55.06 305.62 4.60 -10.19 2.756859 55.465829 65.67 8
124856	3	Launch	300.20 -53.50 38.42 246.90 46.60 -16.20 2.276059 55.897473 8945.86 0
125938	3	Splashdown	1012.55 6.99 51.18 296.37 5.16 -10.75 2.459403 55.929735 99999.00 8

SWS and SHIMS FLIGHT LOG SHEET

Flight #	B258	Date	16/01/07	Operator(s)	AW	log page	1	of	2

Note to operator: Indicate whether entry refers to SWS or SHIMS

Time	Run id	Alt/FL	Mirr Pos	Int Times		Remarks	SWS	USH	LSH
				Vis	NIR				
093000						PREFLIGHT OK			
0936/4330						DARK ALL			
100000						take off ernanfield.			
100417	—	climb out	174°A	400		Scene all in transit. USH 300 LSH 750			
104111		240	6°F			SWS TO ZENITH			
105402	P1	240 ↗	6°F	400		Start P1 → FL280			
105627	P1	260	6°F	400		INT P1 @ FL260			
105928	P1	"	"	"		restart P1			
110131	P1/R1	280	6°F	400		end P1/start R1. INT TIMES USH 300 LSH 750			
110525				750		SWS to 750, USH 300 & LSH 1000 + DARK ALL			
110550		280	6°F	750		Scene all.			
110710						LSH TO 500 & DARK			
110720						LSH Scene.			
110930			174°A			SWS TO NADIR.			
111410		280	174° A	400		SWS TO 400ms + DARK			
111420						SWS Scene.			
111544	R1		174°A	400		end R1			
111706	P2					start P2 ↘ FL260			
112011	P2/R2	260	174°A	400		end P2/start R2			
112531	R2	260	174°A	400		end R2			
112800	P3.1	260 ↘	174°A	400		Start P3.1 Sawtooth			
113253	P3.1/P3.2	215 ↗				end P3.1 start P3.2			
113930	P32/P3.3	280 ↘							
113952	P3.3	280				end P3.3			
114112	P4.1	280 ↘	174°A	400		Start P4.1			
114400						DARK ALL			
114424				400		Scene all INT TIMES USH 300 LSH 500			
115007	P4.1/P4.2	FL200	174°A	400		end P4.1/P4.2			
115200			6°F	400		SWS to Zenith.			
115249			6°F	750		SWS to 750ms, USH 300, LSH 750 + DARK ALL			
115308						Scene all			
115510	P4.2/R3	245	6°F	750		end P4.2 start R3.			
115657				400		SWS to 400ms + DARK			
115703		245	6°F	400		SWS Scene			
120755						LSH to 400 + DARK			
120808						LSH Scene			
120813	R3	245				end R3			
120954	P5					Start P5 → FL300			
121630	P5	300	6°F	400		end P5 @ FL300.			
121828	P6		6 ~~174~~°F	400		Start P6			
122135			174°A	400		SWS TO NADIR			
122143	P6					end P6			
122245	R4	280	174°A	400		Start R4			
122630						DARK ALL			
122642						Scene all.			
123314	R4/P7	280 ↗	174°A	400		end R4/start P7			
123553	P7	300				end P7			
123630		300	174°A	250		SWS + LSH to 250ms + DARK ALL			
123647		300	174°A			Scene all			
123752	R5					Start R5			
124930	R5					end R5			
125129	P8	300 ↘	174°A	250		Start P8			
125958	P8	220				end P8			

SWS and SHIMS FLIGHT LOG SHEET

Flight # B 258 | Date 16/1/07 | Operator(s) Av | log page 2 of 2

Note to operator: Indicate whether entry refers to SWS or SHIMS

Time	Run id	Alt/FL	Mirr Pos	Int Times		Remarks	SWS	USH	LSH
				Vis	NIR				
130023	P9	220	174°A	250		Start P9			
130315	P9	240	-"-	-"-		end P9			
130620	R6	240	174°A	250		Start R6			
130730						DARK ALL			
130740			174°A	250		Scene all INT. USH 300 LSH 250			
131722	R6	240	174°A	250		end R6			
131924	P10.1	240↗	174°A			Start P10.1 to FL300.			
						Broken Sc below & thin Ci above.			
132517	P10.1 | P10.2	300↘	174°A	250		end P10.1 start P10.2			
133016	P10.2	260							
133220	R7	260	174°A	250		Start R7			
133850				400		SWS + LSH to 400ms + DARK ALL			
133915	R7	260	174°A	400		Scene all			
						over broken Sc below. Clear above.			
134417	R7 | P11	260↗	174°A	400		end R7 start P11 → FL280			
134642	P11	280				int P11			
134917		280↗				re Start P11 to FL300			
135115	P11 | R8	300	174°A	400		end P11 start R8 above Ci			
13 5216				500		SWS to 500ms, LSH to 750ms DARK ALL			
13 5227	R8	300	174°A	500		Scene all. NADIR SWS VIEW			
135505			174°A	500		LSH to 500ms + DARK			
5515		300	-"-	500		LSH Scene.			
						NICE LSH & SWS NADIR SIGNAL.			
135921	R8 | P12	300↘							
140258	P12	250	6°F	500		IN Cloud (Ci). SWS to Zenith for next Run.			
140652	P12	220				int P12			
140744						Dark all			
140758						Scene all			
140847	P12	220	6°F	500		restart P12 → FL200			
141128	P12 | R9	200	6°F	500		end P12 & Start R9			
141608						LSH to 1000ms + DARK			
141633			6°F	500		LSH to Scene.			
141707						USH to 500ms + DARK			
141717						USH Scene			
142131	R9	200	6°F	500		end R9 & END OF SCIENCE			
142408						DATA STOP			

ARIES flight log

Flight: B258 | page 1 of 3

Date: 16/1/07 | Operator(s): S.NEWMAN | Res: 1 | Gain A: 2 B: 2

Loc./Notes: CAESAR RADAR VALIDATION FLIGHT, NORTH SEA

Scans: *either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]".* ***View:*** *mirror angle.*

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
093035		1x60	C	C	71.0	31.0	GROUND TESTS
093110		1x60	H	C	71.1	30.8	
093145		120x1	N5	C	71.0	31.0	(the pan) ! N-5° by Mistake
093256		120x1	Z	O	70.9	31.0	overcast and raining
093409		1x60	C	O	71.0	31.4	
093443		1x60	H	O	70.9	30.9	
095922		TAKE-OFF					
103853	FL260	1x60	C	C	71.0	31.0	In transit, clear slot
103930		1x60	H	C	70.9	30.2	
104007		120x1	N	C	70.7	29.9	Looks clear below
104116		120x1	Z	O	70.1	30.3	Clear or ⩽. thin above (sub-vis, if any)
104223		1x60	C	C	70.6	30.6	
104300		1x60	H	C	70.9	30.7	
105609	FL260	1x30	C	C			in climb, interruption
105633		1x30	H	C			
105700		120x1	Z	O	70.3	30.8	(includes turn) to S'board looks clear above
105804		1x30	C	O!			
105823		1x30	H	O!			
105907	FL260-270?	120x1	N	C	70.5	30.7	105935 climb to FL280
110010		1x30	C	C			
110028		1x30	H	C			
110302	R1	1x60	C	C	70.6	71.2	
110335	FL280	1x60	H	C	70.6	30.3	
110411		120x1	N	C	70.6	31.0	Hazy below but can see the ocean — possibly V-thin cloud?
110516		1x60	C	C	70.7	30.3	
110555		1x60	H	C	70.6	30.0	
110658		120x1	Z	O	69.7	30.8	Clear above
110805		120x1	N	C	71.0	30.6	Just getting into cloud? At times.
110923		1x60	C	C	70.6	30.6	
110956		1x60	H	C	70.7	30.5	

ARIES flight log

Flight: B258 | page 2 of 3

Date: 16/1/07 | Operator(s): S.NEWMAN | Res: 1 | Gain A: 2 B: 2

Loc./Notes: NORTH SEA CAESAR FLIGHT

Scans: *either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]".* ***View:*** *mirror angle.*

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
11 4602	(sawtooth)	1x60	C	C	70.5	30.4	Nb. not sure if data are viable in sawtooth
11 4640	"	1x60	H	C	70.6	30.8	
11 4721	"	120x1	Z	O	70.4	30.2	looks clear above + below
11 4835	"	120x1	N	C	70.1	30.6	Unobstructed view of sea surface
11 4941	"	1x60	C	C	70.5	30.7	
11 5027	"	1x60	H	C	70.7	30.5	(Descent into ascent)
122000	P66	1x60	C	C	70.7	30.6	Too early, still in profile
122245	FL280 R4	1x60	C	C	70.6	30.8	
122338		1x60	H	C	70.7	30.2	
122427		300x1	N	C	70.6	30.4	Close to tops or in thin cloud?
122702		1x60	C	C	70.6	29.8	Cloud visible just below + Cu further below / 1226 turning manoeuvre
122746		1x60	H	C	70.7	30.6	
123255	FL300 R5	1x60	C	C	70.3	30.4	
123828		1x60	H	C	70.3	30.7	
123909		300x1	N	C	70.7	31.0	Thinnish cloud directly below, CuSc further below
124155		1x60	C	C	70.3	30.7	
124231		1x60	H	C	70.7	30.3	
124325		480x1	N	C	69.3	29.9	V. thin Ci below, mid-level Cu clearly visible thicker 1246, thin again 1247
124744		1x60	C	C	60.7	29.8	
124820		1x60	H	C	60.7	30.6	
135125	R8 FL300	1x60	C	C	60.8	30.6	
135158		1x60	H	C	60.6	30.6	
135236		480x1	N	C	60.7	29.9	Extensive CuSc field below, V. thin Ci barely visible, thicker though still partially transparent at 1352
135639		1x60	C	C	60.6	30.2	
135716		1x60	H	C	60.9	31.3	
135754		120x1	N	C	60.7	29.9	Thicker (lower?) below clear above
135903		1x60	C	C	60.1	30.0	
135936		1x60	H	C	60.9	30.3	In profile descent
		140210 DRS = ARIES EXACTLY					
141139	R9	1x60	C	C	60.8	30.9	
141214		1x60	H	C	~~30.5~~ 61.0	30.5	

ARIES flight log

Flight: B258 | page 3 of 3

Date: 16/1/07 | Operator(s): S.NEWMAN | Res: 1 | Gain A: 2 B: 2

Loc./Notes: NORTH SEA CAESAR FLIGHT

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
144355	R9 FL200	1x60	C	C	60.8	29.9	
141428		1x60	H	C	60.6	30.6	Waiting for cloud to dissipate at this level
141507		120x1	Z	O	60.3	30.2	Under cloud now, clear at 146 level
141620		1x60	C	C	61.0	30.5	
141654		1x60	H	C	60.8	30.6	
141733		360x1	Z	O	60.2	30.6	patchy thickness above, sky partially visible; CuSc below
142040		60x1	N	C	60.9	30.6	clear patches, CuSc
142117		1x60	C	C	61.1	30.5	
142151		1x60	H	C	60.8	30.6	End of science but still at FL200

Microwave Radiometers FLIGHT LOG	Date	16/01/07	Flight	B258	log pages	
Operator(s)	Jeff Brown		Campaign	WINTEX		
Departure	Cranfield		Arrival	Cranfield		

System start

MARSS

Visual pod inspection						X
Close 3 SSP circuit breakers						X
Close all MARSS circuit breakers						X
FERA on				at time	08:22:00	
Temperature controller initial temps	Ch16	°C	Ch 17	°C	Ch18	°C
Temperature controller set points		54°C		58°C	-20	40°C
MARSS CPU on				at time	08:22:30	
Initial target temperatures	Hot	288.5		Cold	285.3	
Target heating						X
*** CHECK SCAN HEAD CLEAR ***						
Scanning on (LMD box)				at time	08:25:30	
Scan indication		Monitor	›		Visual	

Deimos

Close all Deimos circuit breakers						X
Turn on Deimos CPU						X
*** CHECK SCAN HEAD CLEAR ***						X
Start Deimos Software				at time	08:23:05	
Initial target temperatures	Hot			Cold		
Target heating						
Scan indication		Monitor	›		Visual	
Weather	Cloud			Precip		
	Surface			Pressure		
	Other					

System functionality check

(after initial system warmup, approx 1 hour)

PC to DRS Time error		$t_{PC}=t_{DRS}$ +		at time		
Brightness temps 'sensible'						
Target temps	MARSS:	Hot	324.2	Cold	284.9	
	Deimos:	Hot	324.13	Cold	288.35	

Channel gains 'sensible'	Ch1 A (-)	Ch3 A (-)	Ch1 B (-)	Ch3 B (-)	
	Ch16 (40-44)	Ch17 (45-49)	Ch18 (40-44)	Ch19 (40-44)	Ch20 (44-48)
	215.1	280.5	281.3	281.8	280.8

Power changeover

Headset on before start			X
Listen to engine start sequence	4, 3, 2, 1.		X
LMD off (3 switches, bottom to top)			X
Exit Deimos Software (x)			X
POWER CHANGEOVER			
LMD on (3 switches, top to bottom)	then pushbutton		X
Restart Deimos Software			X
System running again		at time	X
		09:52:00	

Flight #	B	Date		Operator(s)		log page	2	of	2

Time	Run id	Alt/FL	*Remarks*	Sys
09:40:36			CH16 worked briefly but failed after scan head re-started on ground prior to Take Off	**Marss**
10:40:28		**24000**	Time out by 3 seconds – reset	**Marss**
10:53:50	**P1**	**24000**	Profile 1 climb	
10:56:27	**P1**	**26000**	Interrupt of profile 1 climb	
10:59:30	**P1**	**26000**	Re start of profile 1 climb	
11:01:33	**R1**	**28000**	End of profile 1 climb – start of run 1	
11:15:44	**R1**	**28000**	End of run	
11:17:07	**P2**	**28000**	Start of profile 2 descent	
11:20:13	**R2**	**26000**	End of profile 2 descent – Start of run 2	
11:25:31	**R2**	**26000**	End of run	
11:28:00	**P3.1**	**26000**	Start of saw tooth through ci layer descent	
11:32:54	**P3.2**	**21500**	Ascent	
11:39:31	**P3.2**	**28000**	End of profile	
11:41:13	**P4.1**	**28000**	Start of saw tooth descent through ci layer	
11:50:15	**P4.2**	**20000**	End of 4.1 – start of 4.2 ascent	
11:55:09	**P4.2**	**24500**	End of profile 4.2 – start of run 3	
12:08:13	**R3**	**24500**	End of run	
12:09:54	**P5**	**24500**	Start of profile climb	
12:16:13	**P5**	**30000**	End of profile	
12:18:32	**P6**	**30000**	Start of profile descent	
12:20:42	**P6**	**28000**	End of profile	
12:22:44	**R4**	**28000**	Start of run	
12:33:14	**R4**	**28000**	End of run – start of profile 7 ascent	
12:35:54	**P7**	**30000**	End of profile 7 ascent	
12:37:52	**R5**	**30000**	Start of run 5	
12:38:17		**30000**	Dropsonde 1	
12:43:26		**30000**	Dropsonde 2	
12:48:55		**30000**	Dropsonde 3	
12:49:13	**R5**	**30000**	End of run	
13:00:00	**P8**	**22000**	End of profile descents	
13:00:23	**P9**	**22000**	Start of profile ascent	
13:03:14	**P9**	**24000**	End of profile ascent	
13:06:20	**R6**	**24000**	Start of run	
13:17:22	**R6**	**24000**	End of run	
13:19:24	**P10.1**	**24000**	Start of saw tooth ascent	
13:25:17	**P10.1**	**30000**	End of profile ascent start of profile descent	
13:30:16	**P10.2**	**26000**	End of profile descent	
13:32:20	**R7**	**26000**	Start of run	
13:39:55			Reset time as 5 seconds gained	**Marss**
13:44:18	**R7**	**26000**	End of run – start of profile climb	
13:46:42	**P11**	**28000**	Interrupt of profile climb	
13:49:18	**P11**	**28000**	Re-start of profile climb	
13:51:15	**P11**	**30000**	End of profile climb – start of run	
13:59:21	**R8**	**30000**	End of run – start of profile descent	
14:06:52	**P12**	**22000**	Interrupt of profile descent	
14:08:49	**P12**	**22000**	Re-start of profile descent	
14:11:28	**P12**	**20000**	End of profile descent – start of run	
14:21:32	**R9**	**20000**	End of run. End of science.	

Flight: B258

KEY

- Not Fitted
- Fitted, Not Operated
- Duff Data
- Minor Problems
- OK

Thermometers
- Cabin Temperature:
- Heimann:
- Deiced Temp:
- Non-deiced Temp:

Hygrometers
- FWVS:
- General Eastern:
- Johnson Williams:
- Nevzorov:
- Total Water Probe:

Cameras
- Downward Facing:
- Forward Facing:
- Rearward Facing:
- Upward Facing:

Navigation + Aircraft
- Cruciform GPS:
- GIN Applanix:
- INU Honeywell:
- Radar Altimeter:
- RVSM IAS:
- RVSM Static Pressure:
- XR5 GPS:

Misc Core
- AMTG:
- AVAPS:
- Cabin Pressure:
- Fax machine:
- Printer:
- S9 Static Pressure:
- Satcom C:
- Satcom H:
- Turbulence Check Press:
- Turbulence Diff Press:
- Weather Radar:

DLUs:
- DLU AERACK:
- DLU BBR Lower:
- DLU BBR Upper:
- DLU Core Chem:
- DLU Core Consoles:
- DLU Port Aft:
- DLU Port Fwd:
- DLU Stbd Fwd:

Radiometers
Lower:
- BBR (clear) Lower:
- BBR (IR) Lower:
- BBR (red) Lower:

Upper:
- BBR (clear) Upper:
- BBR (IR) Upper:
- BBR (red) Upper:

- ARIES:
- DEIMOS:
- IR Camera:
- JNO2 Lower:
- JNO2 Upper:
- JO1D Lower:
- JO1D Upper:
- MARSS:
- SHIMS Lower:
- SHIMS Upper:
- SWS:
- TAFTS:

Cloud Probes
- 2DC:
- 2DP:
- FFSSP:
- PCASP:

- ADA:
- CCN:
- CDP:
- CIP 100:
- CIP 25:
- CPI:
- CVI:
- SID1:
- SID2:

Aerosol
- CPC 3025A:
- Filters 47mm:
- Filters 90mm:
- Neph - Dry:
- Neph - Wet:
- PSAP:

- AMS:
- CPC 3010A:
- INC:
- VACC:

Chemistry
- CO Aerolaser 5002:
- NOx TE42C:
- Ozone TE49C:
- Ozone TE49:
- SO2 TE43C:
- TDLAS (NIR) CH4:
- TDLAS (NIR) CO2:

- FAGE:
- Formaldehyde:
- NOxy:
- ORAC:
- PAN:
- PERCA:
- Peroxide:
- PTRMS:
- TDLAS (1C):
- WAS Bags:
- WAS Bottles:

Misc Non-Core
- CASI/ATM:
- LIDAR:
- LTI:
- SAW Hygrometer:

Report Created 19/01/2007 11:35:51

Last Updated: 17/01/2007 15:36:55

Faults / Incidents Log

Flight No. B258
Date: 16th January 2007

Instruments

1. Cruciform GPS – u/s

2. TWC status flagged at high level / low temperatures (< -41 degC). Sample Temp below normal operating limits i.e. = 595 DRSU, should be above 640 DRSU. Detector signal doesn't respond to changes in humidity very well.

3. Turbulence probe P0 froze from ~ 1008Z to ??Z. Water may not be getting into the traps but remaining in the pipes. Checked ports at Newcastle. Water dripping out of lower port. Nothing in centre port trap. Water or debris may be in

4. Downward and Rear Facing cameras - looks like water inside window during taxy.

5. DEC Terminal window - being corrupted by sections of other windows even when DEC Term is on top. Rebooted pc pre-flight, still the same.

6. CVI – hasn't been connected since refitting, most cables still behind dado panel. Connected up in flight but don't know if it's fully working.

7. Upper Pyrgeometer okay till 1022 then signal dropped to – 800W/m2. Recovered occasionally during flight. May be temperature related?

8. CO noisy from 11:45Z onwards. DEIMOS switched on during transit return from Newcastle, didn't appear to cause any interference on the CO.

9. Core Chem pump switches (NO & O3) bent, pack some spares for GFDEX!

10. Heimann Calibration control unit – doesn't appear to be controlling target temperature consistently.

11. DEIMOS – caused a lot of noise on PCASP during the transit test.

Aircraft

1. Water drained off cabin ceiling onto floor and Core Console fore at start of taxy.

2. Intercom box on Jif Rack intermittent in Tx mode on Training Net pre-flight.

3. Oxygen panel at Port Window 9 partly down. LTI pipe at JIF rack stopping it from coming right down.

Satcom H Calls
1 – Met Office

Pre-Flighter's Log

Date: 16/1/07 Flight No: B258 Pre-Flighter: Doug A.

Item	√ or x	Location	Action	Comments
1	✓	Hangar	Collect Dustbin, put on a/c	
		Aircraft Cabin		
2	✓	Core Chemistry	Gases x 3 ON	
3	✓	Cabin	All Racks Checked	
4	✓	Fwd CorCon	All reqd CBs made	
5	✓	Aft CorCon	CBs made, PCs ON	
6	✓	HORACE	Optical Disk loaded	
7	✓	HORACE	Recording data	
8	✓	HORACE	DLU Status Checked	
9	✓	HORACE	HORACE Status Checked	
10	✓	Satcom H	Power LED ON	
11		Nevzorov	Checked and OFF	
12	✓	GPS	Checked	
13	✓	INU	Align	
14	✓	Cameras Pictures	Checked x 4 OK	
15	✓	Core Chemistry	Instruments Checked OK	
16	✓	Core Chemistry	CO Flows Checked OK	
17	na	FWVS	Set up	not fitted.
18	✓	Video x 2	Records okay, Rewind	
19	✓	Delced Rosemount	Heater Checked / Set	
20	✓	Heimann	Calibration Checked	
21		TWC	ON & Checked	Cover ON : RAWNG
22	✓	GE	Balance checked	
23	✓	INU	Navigate then back to Align	
24	✓	Hubs x 4	Checked ON	
25	✓	Fwd Console	Miss. Sci Laptop CB made	& CB on Port Fwd SSP
26	✓	CNC	Butanol filled	
27	X	CGPS	Set up	not fitted
28	✓	Miss. Sci Laptop	Checked Onboard	

External Checks overleaf →

Pre-Flighter's Log

Item	√ or x	Location	Action	Comments
		External		
29	✓	Turb Probe	Clean if reqd, Photo taken	
30	✓	JW	Cleaned & Checked	
31	✓	DI Rosemount	Cleaned & Checked	
32	✓	NDI Rosemount	Cleaned & Checked	
33		Nevzorov	Cleaned/windings checked	
34	✓	GE	Cleaned & Checked	
35	✓	Lower BBRs	Domes cleaned/checked	
36	✓	Camera Windows	Cleaned	
37		Heimann	Lens checked OK	
38	✓	TWC Cover	Fitted if required	
39	✓	All other covers	Removed	
40		Dustbin	Returned to hangar	
41		Tools	Check ALL in Toolkit	
42		Tools	Avalon informed	
	✓	**Avalon Checks**		Signed
43	✓	Upper BBRs Checked & Cleaned		
44	✓	ICEX applied		
45	✓	Traps empty (weekly only)		

MISSING LOG SHEETS:

The following log sheets are not available for flight B258:

Log	Reason
Core Chemistry	pre flight only, unmanned operation on auto calibrate so no In Flight log

Document control

Revision	Date	Author	Comments
r0	8 Mar 2007	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

VIDEO RECORDINGS:

3 x Forward Facing Cameras
3 x Up/Downward Facing Cameras

Digital8 video recordings from this flight reside with :

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